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Description: Substituted Sulfonylglycolic Acid Anilides

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Amendment to: —

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Separation from: —

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Applicant: Badische Anilin- & Soda-Fabrik AG, 6700 Ludwigshafen

Representative per § 16 Patent Law: —

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Named as Inventor: Rohr, Wolfgang, Dr., 6800 Mannheim;
Fischer, Adolf, Dr., 6704 Mutterstadt

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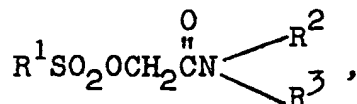
6700 Ludwigshafen, 12.03.1971

Substituted Sulfonyl Glycolic Acid Anilides

This invention pertains to new, valuable N-substituted sulfonylglycolic acid anilides and their use as herbicides.

It is known that substituted acid anilides, for example, the chloroacetic acid-N-isopropylanilides, the chloroacetic acid N-propargylanilides, or the chloroacetic acid-N-isobutinylnilides are used as herbicides. Their effect, however, is not satisfactory.

It has been found that N-substituted Sulfonyl glycolic acid anilides with the formula



wherein R^1 represents an alkyl, cycloalkyl, halogenalkyl, aralkyl, alkenyl, or halogenalkenyl-moiety or a phenyl-moiety, which may be substituted by alkyl, halogenalkyl, alkoxy, halogen or the nitro group, R^2 represents a phenyl-moiety, which may be substituted by alkyl, R^3 represents an alkyl-moiety with more than two carbon atoms, a cycloalkyl-moiety, an alkenyl or alkenyl-moiety, and R^2 and R^3 together with the nitrogen atom, who's substitutes they are, represent a heterocyclic moiety, which may contain nitrogen or oxygen in its ring, have good herbicidal properties.

Accordingly, R may represent, for example:

Methyl, chlormethyl, ethyl, 2-chlorethyl, n-propyl, i-propyl, n-butyl, i-butyl, sec.-butyl, tert.-butyl, pentyl, cyclopentyl, hexyl, cyclohexyl, benzyl, vinyl, allyl, butenyl, pentenyl, hexenyl, phenyl, 4-methylphenyl, 4-chlorophenyl, 4-bromophenyl, 4-nitrophenyl, 4-fluorophenyl, 4-iodine phenyl, 4-ethylphenyl, 2-nitrophenyl, 3-nitrophenyl, 3,4-dichlorophenyl etc.

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R may represent:

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phenyl, 2-methylphenyl, 3-methylphenyl, 4-methylphenyl, 2-ethylphenyl, 4-ethylphenyl, 2,6-dimethylphenyl, 2,6-diethylphenyl, 2,5-dimethylphenyl, 3,5-dimethylphenyl, 3,4-dimethylphenyl, 2,4-dimethylphenyl, 2,5-dimethylphenyl, 2,4,6-trimethylphenyl, 2,4,5-trimethylphenyl, 4-isopropylphenyl, 2-isopropylphenyl, 2-methyl-6-ethylphenyl, 2,6-diisopropylphenyl etc.

R^3 can represent the following moieties:

n-propyl, i-propyl, n-butyl, i-butyl, sec.-butyl, tert.-butyl, pentyl, cyclopentyl, hexyl, cyclohexyl, allyl, butenyl, pentenyl, hexenyl, propargyl, butinyl, pentinyl, hexinyl.

The compounds described in this invention can be manufactured by the transformation of a substituted glycolic acid anilides with a substituted sulfonyl chloride in the presence of an acid acceptor, like triethylamine, for example.

The following embodiments explain the manufacture of the compounds.

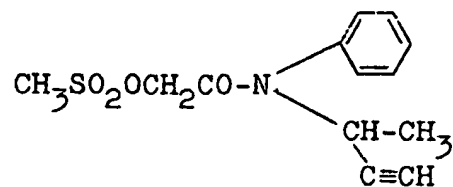
Embodiment 1

Manufacture of 0-Methyl sulfonyl glycolic acid-(N-butin-1-yl-3)-anilides

A solution of 30.5 volume parts N-Butin-1-yl-3-glycolic acid-anilide and 27,6 volume parts triethylamine in 920 volume parts dichloromethane was spiked at 0°C within 20 minutes with a solution of 21 volume parts methane sulfochloride in 26 volume parts of dichloromethane. After an additional 45 minutes, the reaction mixture was washed with ice water, with a cool 5% hydrochloric acid, and finally with a cold, saturated sodium carbonate solution. The organic phase was dried with magnesium sulfate and concentrated in the vacuum. While cooling, the oily residue became crystalline after adding a small amount of ether. The raw product was recrystallized from the ether: Pp. 58 ° is 60°C.

The compound has the following chemical structure:

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Accordingly, the following compounds make be produced as well:

O-methylsulfonyl glycolic acid-(N-propargyl) anilide

O-ethylsulfonyl glycolic acid-(N-propargyl) anilide

O-propylsulfonyl glycolic acid-(N-propargyl) anilide

O-i-propylsulfonyl glycolic acid-(N-propargyl) anilide

O-n-Butylsulfonyl glycolic acid-(N-propargyl) anilide

O-ethylsulfonyl glycolic acid-(N-butin-1-yl-5) anilide,
Melting point (Fp.): 76 to 78°C.

O-propylsulfonyl glycolic acid-(N-butin-1-yl-3) anilide,
Fp. 50 to 52°C

O-i-Propylsulfonyl glycolic acid-(N-butin-1-yl-3) anilide,
Fp. 83 to 85°C

O-n-butylsulfonyl glycolic acid-(N-butin-1-yl-3) anilide,
Fp. 69 to 71°C

O-cyclohexylsulfonyl glycolic acid-(N-butin-1-yl-3) anilide,
Fp. 99 to 100°C

O-chloromethylsulfonyl glycolic acid-(N-but in-1-yl-3) anilide,

O-methylsulfonylglycolic acid-(N-3-fnethylbutin-1-yl-3) anilide,

O-ethylsulfonyl glycolic acid-(N-3-methylbutin-1-yl-3) anilide

O-propylsulfonyl glycolic acid-(N-3-methylbutin-1-yl-3) anilide

O-i-propylsulfonyl glycolic acid-(N-3-methylbutin-1-yl-3) anilide

O-n-butylsulfonylglycolic acid-(N-3-methylbutin-1-yl-3) anilide

O-phenylsulfonyl glycolic acid-(N-butin-1-yl-j5) anilide,
Fp. 86 to 87°C

O 4-methylphenylsulfonyl glycolic acid-(N-butin-1-yl-3) anilide,
Fp. 67 to 69°C

O-4-chlorophenylsulfonyl glycolic acid-(N-butin-1-yl-3) anilide, Oil

O-methylsulfonyl glycolic acid-(N-i-propyl) anilide,
Fp. 92 to 93°C

O-Methylsulfonylglycolic acid-(N-i-b utyl) anilide,
Fp. 70 to 71°C

O-methylsulfonylglycolic acid-(N-tert-butyl) anilide

O-ethylsulfonylglycolic acid-(N-i-propyl) anilide

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O-ethylsulfonyl glycolic acid-(N-i-butyl) anilide
 O-ethylsulfonyl glycolic acid-(N-tert.-butyl) anilide
 O-propylsulfonyl glycolic acid-(N-i-propyl) anilide
 O-propylsulfonyl glycolic acid-(N-i-butyl) anilide
 O-i-propylsulfonyl glycolic acid-(N-i-propyl) anilide
 O-phehylsulfonyl glycolic acid-(N-i-propyl) anilide
 O-4-methylphenylsulfonyl glycolic acid-(N-i-propyl) anilide
 O-4-chlorophenylsulfonyl glycolic acid-(N-i-propyl) anilide
 O-phenylsulfonyl glycolic acid-(N-propargyl) anilide
 O-4-methylphenylsulfonyl glycolic acid-(N-propargyl) anilide
 O-4-chlorophenylsulfonyl glycolic acid-(N-propargyl) anilide
 O-methylsulfonyl glycolic acid-(N-allyl) anilide
 O-ethylsulfonyl glycolic acid-(N-allyl) anilide
 O-propylsulfonyl glycolic acid-(N-allyl) anilide
 O-n-butylsulfonyl glycolic acid-(N-allyl) anilide
 O-phenylsulfonyl glycolic acid-(N-allyl) anilide
 O-4-methylphenylsulfonyl glycolic acid-(N-allyl) anilide
 O-4-chlorophenylsulfonyl glycolic acid-(N-allyl) anilide.

The partial or complete hydration of the triple carbon bond of suitable O-sulfonyl-N-alkinyl-glycolic acid anilides can be used to produce the corresponding O-Sulfonyl-N-alkenyl- or O-Sulfonyl-N-alkyl-glycolic acid anilides.

Embodiment 2

Manufacture of O-Methylsulfonyl glycolic acid-(N-buten-1-yl-3)-anilide

A solution of 28.1 volume parts of O-Methylsulfonyl glycolic acid-(N-buten-1-yl-3) anilide in 180 volume parts acetic acid ethylester was spiked with 1 part of a catalyst (0.7 volume parts Palladium on calcium carbonate spiked with zinc), and was hydrated for acceptance of 2350 volume parts of hydrogen at room temperature and at 0.02 atmospheres. Afterwards, the catalyst was removed, the solution was dried in vacuum, and the residue was recrystallized from ether. Fp. 54 to 55°C.

Accordingly, the complete hydration using a Palladium catalyst on coal (10%) produces the

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O-Methylsulfonyl glycolic acid-(N-sec. -butyl) anilide, Fp.
68 to 70°C.

The products of the invention can be used as solutions, emulsions, suspensions or as dusting agents. The type of application depends entirely on the purpose, in any case, they will warrant the fine distribution of the effective substance.

For the production of directly sprayable solutions, hydrocarbons with boiling points above 150°C, e.g. tetrahydronaphtaline or alkylated naphthalenes or organic liquids with boiling points above 150°C, and one or more functional group, e.g. the keto group, the ether group, the ester group, or the amide group, whereby this group stands as substitute on a hydrocarbon chain or could be components of a heterocyclic ring, can be used as spray liquids.

Watery applications can be prepared from emulsion concentrates, pastes or reticulable powders (spray powders) by adding water. For the production of emulsions, the substances themselves or dissolved in a solvent, with reticulation or dispersion means, e.g. polycontrol agents additives, can be homogenized in water or organic solvents. However, effective substance can also be used to produce concentrates consisting of emulsifiers or dispersing agents and potentially solvents, which are suitable to be diluted with Water. Oils and adhesives can also be added.

Dusting agents can be produced by mixing or wedding the effective substances with a solid carrier substance, e.g. diatomaceous earth, talcum, clay or fertilizers.

Granulates can be produced via bonding to solid carrier substances.

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Embodiment 3

Loamy sandy soil was filled into test containers and sown with the seeds of *Zea mays* (corn), *Soja hispida* (soy bean), *Gossypium hirsutum* (cotton), *Echinochloa crus galli* (chicken millet), *Setaria* spp. (bristle millet types), *Poa trivialis* (rough meadow grass), *Lolium multiflorum* (Italian ray grass, and *Sinapis arvensis* (charlock).

Subsequently, the solid was treated with 0-methylsulfonyl glycolic acid-(N-butin-1-yl-3) anilide (I), 0-Methylsulfonyl glycolic acid-(N-sec.-butyl)- anilide (II) and with the control agents N-Propargyl- α -chloracet anilide (III) and N-Butin-(1)-yl-(3)- chloroacetic acid anilide (VII) - each with a quantity of 2 kg of the effective agent per ha, dispersed in 500 Liters of water per ha.

After 4 to 5 weeks, I and II exhibited at equally good tolerance in regard to economic plants a stronger herbicidal effect against weeds and grasses than III and VII.

The result is summarized in the following table:

	Effective Agent			
	I	II	III	VII
<i>Zea mays</i> (corn)	0	0	0	0
<i>Soja hispida</i> (soy bean)	0	0	0	10
<i>Gossypium hirsutum</i> (cotton)	0	0	0	0
<i>Echinochloa crus galli</i> (chicken millet)	100	100	70	95
<i>Setaria</i> spp. (bristle millet)	100	95	70	85
<i>Poa trivialis</i> (rough meadow grass)	100	75	40	65
<i>Lolium multiflorum</i> (Italian ray grass Raygras)	95	75	40	70
<i>Sinapis arvensis</i> (charlock)	75	40	20	20

0 = no damage

100 = total damage

The following compounds were biologically equally effective as I and II:

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O-methylsulfonyl glycolic acid-(N-i-propyl) anilide

O-methylsulfonyl glycolic acid-(N-isobutyl) anilide.

Embodiment 4

At a growing height of 5 to 15 cm, the plants Zea mays (corn), Triticum aestivum (wheat), Echinochloa crus galli (chicken millet), Setaria spp. (Bristle millet types) and Panicum spp. (panicle millet types) were treated with the compounds of O-methylsulfonyl glycolic acid- (N-butin-1 -yl-3) anilide (I) O-methylsulfonyl glycolic acid-(N-sec-butyl) anilide (II) and the control agents

N-propargyl- α -chloroacetanilide (III)

N-butin-(1)-yl-(3)- α -chloroacetanilide (VII)

The application rate each was 3 kg effective agent per ha, dispersed in 500 Liter water per ha.

After 3 to 4 weeks it was determined that the effective agents I and II with good selectivity on Zea mays (corn) showed a stronger herbicidal effect on weeds and grasses than the control agents III and VII.

The results can be obtained from the following table:

	Effective Agent			
	I	II	III	VII
Zea mays (corn)	0	0	0	0
Triticum aestivum (wheat)	0	0	10	30
Echinochloa crus galli (chicken millet)	95	80	65	70
Setaria spp. (bristle millet types)	80	70	55	50
Panicum spp. (panicle millet types)	85	75	60	50
Matricaria chamomilla (true chamomille)	90	80	60	70

0 = no damage, 100 = total damage

The following compounds were biologically equally effective as I and II:

O - methylsulfonyl glycolic acid -(N-i-propyl) anilide

O - methylsulfonyl glycolic acid- (N-isobutyl)anilide.

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Embodiment 5

Loamy sandy soil was filled into test containers and sown with the seeds of *Zea mays* (corn), *Soja hispida* (soy bean), *Gossypium hirsutum* (cotton), *Beta vulgaris* (beets), *Echinochloa crus galli* (chicken millet), *Setaria* spp. (Bristle millet types), *Poa trivialis* (rough meadow grass), *Bromus tectorum* (bromegrass) and *Alopecurus myosuroides* (blackgrass).

The prepared soil was subsequently treated with the agents 0-methylsulfonyl glycolic acid-(N-butin-1-yl-3)anilide (IV) 0-n-butylsulfonylglycolic acid-(N-butin-1-yl-j5)anilide (V) and the control agents N-isopropyl- α -chloroacetanilide (VI) N-butin-(1)-yl-(3)- α -chloroacetanilide (VII) - at an application rate of 2 kg agent per ha, dispersed in 500 liters of water per ha.

After 4 to 5 weeks, agents IV and V showed at equally good economic plant tolerance a stronger herbicide effect than agents VI and VII.

The results can be obtained from the following table.

	Effective Agents			VII
	IV	V	VI	
<i>Zea mays</i> (corn)	0	0	0	0
<i>Soja hispida</i> (soy bean)	0	0	0	10
<i>Gossypium hirsutum</i> (cotton)	0	0	0	0
<i>Beta vulgaris</i> (beets)	0	0	0	10
<i>Echinochloa crus galli</i> (chicken millet)	100	100	70	95
<i>Setaria</i> spp. (Bristle millet types)	100	100	70	85
<i>poa trivialis</i> (rough meadow grass)	95	95	40	65
<i>Bromus tectorum</i> (bromegrass)	95	95	40	45
<i>Alopecurus myosuroides</i> (blackgrass)	100	70	50	60

0 = no damage

100 = total damage,

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Embodiment 6

The plants *Zea mays* (corn), *Gossypium hirsutum* (cotton), *Beta vulgaris* (beets), *Echinochloa orus galli* (chicken millet), *Poa annua* (annual panicle grass), *Panicum* spp. (panicle millet types) and *Avena fatua* (wild oat) were treated at a growing height of 3 to 15 cm with the agents
0- ethylsulfonyl glycolic acid-(N-butin-1-yl-3) anilide (IV)
0-n-butylsulfonyl glycolic acid -(N-butin-1-yl-3) anilide (V)
and the control agents
N-isopropyl- α -chloroacetanilide (VI) and
N-butin-(1)-yl-(3)- α -chloroacetanilide (VII)
- at an application rate of 4 kg of agent per ha, dispersed in 500 liters of water per ha.

After 3 to 4 weeks it was determined that agents IV and V at equally good plant selectivity showed a stronger herbicidal effect against weeds than the control agents VI and VII.

The results can be obtained from the following table.

	Agents			
	IV	V	VI	VII
<i>Zea mays</i> (corn)	0	0	5	10
<i>Gossypium hirsutum</i> (cotton)	0	0	25	25
<i>Beta vulgaris</i> (beets)	10	0	20	30
<i>Echinochloa crus galli</i> (chicken millet)	90	85	70	80
<i>Poa annua</i> (annual panicle grass)	90	90	30	60
<i>Panicum</i> spp, (panicle millet)	95	90	65	70
<i>Avena fatua</i> (wild oat)	80	80	40	45

0 = no damage

100 = total damage

Embodiment 7

Mixing 90 volume parts of compound I with 10 volume parts of N-Methyl- α -pyrrolidon results in a solution that is well suited for application in the form of the smallest droplets.

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Embodiment 8

20 volume parts of compound II are solved in a mixture consisting of 80 volume parts xylol, 10 volume parts of the product accumulation of 8 to 10 mol control agents to 1 mol oleic acid N-monoethanolamide, 5 volume parts calcium salt of the dodecylbenzol sulphonic acid, and 5 volume parts of the product accumulation of 40 Mol ethylene oxide to 1 mol ricinus oil. By pouring and fine distribution of the solution in 100,000 volume parts water, the result is a watery dispersion containing 0.02 weight percent of the agent.

Embodiment 9

20 volume parts of the compound IV are solved in a mixture containing 40 volume parts cyclohexanon, 30 volume parts isobutanol, 20 volume parts of the product accumulation of 7 mol ethylene oxide to 1 mol isooctylphenol, and 10 volume parts of the product accumulation of 40 mol ethylene oxide to 1 mol ricinus oil. By pouring and fine distribution of the solution in 100,000 volume parts water, the result is a watery dispersion containing 0.02 weight percent of the agent.

Embodiment 10

20 volume parts of the compound V are solved in a mixture consisting of 25 volume parts cyclohexanol, 65 volume parts of a mineral oil fraction of the product accumulation of 40 mol ethylene oxide to 1 mol ricinus oil. By pouring and fine distribution of the solution in 100,000 volume parts water, the result is a watery dispersion containing 0.02 weight percent of the agent.

Embodiment 11

20 volume parts of agent I are thoroughly mixed with 3 volume parts of the sodium salt of the Diisobutyl-naphthalene- α -sulphonic acid, 17 volume parts of the sodium salt of a lignin-

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acid of a sulfite waste liquor, and 60 volume parts of powdered silicon dioxide gel well mixed and married in a hammer mill. The fine distribution of the mixture in 20,000 volume parts water results in a spray mixture containing 0.1 weight percent of the agent.

Embodiment 12

3 volume parts of compound II are closely mixed with 97 volume parts of fine kaolin. This results in a dusting agent, which contains 3 weight percent of the agent.

Embodiment 13

30 volume parts of compound IV are closely mixed with a mixture of 92 volume parts powdered silicon dioxide gel and 8 volume parts of paraffin oil, which has been sprayed onto the surface of this silicon dioxide gel. This method results in a conditioning of the agent with good adhesive properties.

Embodiment 14

In the greenhouse, test containers were filled with loamy, sandy soil and planted with seeds of corn (*Zea mays*), cotton (*Gossypium hirsutum*), soy beans (*Glycine [Soja] hispida*), beets (*Beta vulgaris*), vegetable cabbage (*Brassica oleracea*), chicken millet (*Echinochloa crus galli*), greater bristle millet (*Setaria faberii*), blackgrass (*Alopecurus myosuroides*), and Indian Korakan (*Eleusine indica*). Afterwards, the prepared soil was treated with 1 and 2 kg/ha each of the active substance of the agents

- I 0-methylsulfonyl glycolic acid-/N-butin-(1)-yl-(3)/ anilide
- II 0-n-butylsulfonyl glycolic acid-/N-butin-(1)-yl-(3)/ anilide
- III 0-phenylsulfonyl glycolic acid-/N-butin-(1)-yl-(3)/ anilide
- IV 0-p-methylphenylsulfonyl glycolic acid-;[N-butin-(1)-yl-(3)/ anilide

in comparison to

- V 0-methylsulfonyl glycolic acid-(N-methyl) anilide,

each emulgated in 500 liters of water per ha. After 4 to 5 weeks, agents I to IV showed in comparison to agent V ay equally good

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economic plant tolerance a stronger herbicidal effect.

The test results can be obtained from the following table.

Agent kg/ha	I		II		III	
	1	2	1	2	1	2
Zea raays (corn)	0	0	0	0	0	0
Gossypium hirsutum (cotton)	0	0	0	0	0	0
Soja (Glycine) hispida (soy bean)	0	0	0	0	0	0
Beta vulgäris (beets)	0	0	0	0	0	0
Brassica oleracea (vegetable cabbage)	0	0	0	0	0	0
Echinochloa crus galli (chicken millet)	90-100	100	100	100	90	90-100
Setaria faberii (greater bristle millet)	90-100	100	100	100	90	90-100
Alopecurus myosuroides (blackgrass)	80	90	90	100	60-70	80
Eleusine indica (Indian Korakan)	90-100	100	90-100	100	90	90-100

Agent kg/ha	IV		V	
	1	2	1	2
Zea mays (corn)	0	0	0	0
Gossypium hirsutum (cotton)	0	0	0	0
Soja (Glycine) hispida (soy beans)	0	0	0	0
Beta vulgaris (beets)	0	0	0	0
Brassica oleracea (vegetable cabbage)	0	0	0	0
Echinochloa crus galli (chicken millet)	90-100	100	70-80	90
Setaria faberii (greater bristle millet)	90-100	100	70	80-90
Alopecurus myosuroides (blackgrass)	80-90	90-100	50-60	70-80
Eleusine indica (Indian Korakan)	90-100	100	70-80	80-90

0 = no damage
100 = total damage

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Embodiment 15

In the greenhouse, the plants corn (*Zea mays*), soy beans (*Glycine* [soy] *hispida*), cotton (*Gossypium hirsutum*), beets (*Beta vulgaris*), rice (*Oryza sativa*), wheat (*Triticum aestivum*), barley (*Hordeum vulgäre*), Indian Korakan (*Eleusine indica*), chicken millet (*Echinochloa crus galli*), greater bristle millet (*Setaria faberii*), panicle millet (*Panicum virgatum*), Blood millet (*Digitaria sanguinalis*), blackgrass (*Alopecurus myosuroides*) and annual meadow grass (*Poa annua*) were treated at a growing height of the economic plants of 7 to 15 cm and of the weeds and grasses of 2 to 10 cm with 1 kg/ha each of the active substance of the agents

I O-methylsulfonyl glycolic acid-[N-butin-(1)-yl-(3)] anilide

II O-n-butylsulfonylglycolic acid-[N-butin-(1)-yl-(3)]anilide
in comparison to

III O-methylsulfonyl glycolic acid-(N-methyl) anilide,
each emulsified in 500 liters of water per ha. After 3 to 4 weeks, agents I and II showed at equally good economic plant tolerance a stronger herbicidal effect.

The test result can be obtained from the following table.

	Agent		
	I	II	III
<i>Zea mays</i> (corn)	0-10	0-10	10
<i>Glycine</i> (Soja) <i>hispida</i> (soy bean)	0	0	5
<i>Gossypium hirsutum</i> (cotton)	0	0	0
<i>Beta vulgaris</i> (beets)	0	0	0
<i>Oryza sativa</i> (rice)	0-10	0-10	0-10
<i>Triticum aestivum</i> (wheat)	0-10	0-10	0-10
<i>Hordeum vulgäre</i> (barley)	0-10	0-10	0-10
<i>Eleusine indica</i> (Indian Korakan)	90-100	90-100	60-70
<i>Echinochloa crus galli</i> (chicken millet)	90-100	100	40-50
<i>Setaria faberii</i> (greater bristle millet)	90-100	100	60
<i>Panicum virgatum</i> (panicle millet)	90-100	100	60
<i>Digitaria sanguinalis</i> (blood millet)	90-100	90-100	60-70
<i>Alopecurus myos.</i> (blackgrass)	90-100	100	60-70
<i>Poa annua</i> (annual meadow grass)	100	100	70-80

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0 = no damage
100 = total damage

Equally biologically effective as agents I and II are the compounds

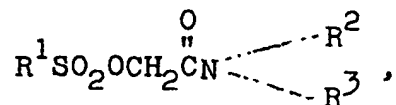
O-phenylsulfonyl glycolic acid-[N-butin-(1)-yl-(3)-]anilide and

O-p-methylphenylsulfonyl glycolic acid-[N-butin-(1)-yl-(3)]-

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Patent Claims

1. N-substituted sulfonyl glycolic acid anilides of the formula



wherein R represents an alkyl, cycloalkyl, halogenalkyl, aralkyl, alkenyl or halogen alkenyl moiety or a phenyl-radical potentially substituted by an alkyl, halogen alkyl, alkoxy, halogen or the nitro group, R² represents a phenyl-moiety potentially substituted by an alkyl, and R³ an alkyl-radical with more than two carbon atoms, a cycloalkyl-radical, an alkenyl or alkenyl radical ~~and R₂ and R₃, together with the nitrogen atom, which they are substituting, represent a heterocyclic moiety, which may also contain nitrogen or oxygen in its ring.~~

2. Herbicide, containing a solid or liquid carrier substance and a N-substituted sulfonyl glycolic acid anilide, per claim 1.
3. Use of a compound pursuant to claim 1 as an herbicide.
4. 0-methylsulfonyl glycolic acid-(N-butin-1-yl-3) anilide.
5. 0-ethylsulfonyl glycolic acid-(N-butin-1-yl-3) anilide.
6. 0-n-propylsulfonyl glycolic acid-(N-butin-1-yl-3) anilide.
7. 0-i-propylsulfonyl glycolic acid-(N-butin-1-yl-3) anilide.
8. 0-n-butylsulfonyl glycolic acid-(N-butin-1-yl-3) anilide.
9. 0-methylsulfonyl glycolic acid-(N- isopropyl) anilide.
10. 0-methylsulfonyl glycolic acid-(N-i-butyl) anilide.
11. 0-methylsulfonyl glycolic acid-(N-sek-butyl) anilide.

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12. 0-methylsulfonylglycolic acid-(N-buten-1-yl-3)-anilide.
13. 0-phenylsulfonylglycolic acid-(N-butin-1-yl-3)-anilide.
14. 0-4-methylphenylsulfonyl glycolic acid-(N-butin-1-yl-3) anilide.
15. 0-4-chlorphenylsulfonyl glycolic acid-(N-butin-1-yl-3) anilide.

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CERTIFICATE OF TRANSLATION

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I, Angela Christie, hereby certify that I am competent in both English and German languages.

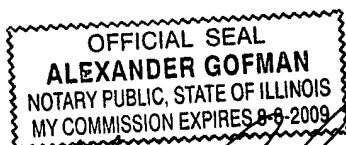
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A handwritten signature in cursive script that reads 'Angela B. Christie'.

Professional Translator



A handwritten signature in cursive script that reads 'Alexander Gofman'.

12.05.2006